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Sheriffs' Retirement System

Actuarial Valuation as of July 1, 1990

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Section I

Introduction

An actuarial valuation of the Sheriffs' Retirement System of the State of Montana has been completed as of July 1, 1990. This valuation was authorized by the Public Employees' Retirement Board under Section 19-7-201, MCA. The purpose of the valuation was to determine the financial position of the fund, the normal cost, and the unfunded accrued liability based upon present and prospective assets and liabilities of the system as of July 1, 1990.

Section II presents an analysis of the results of the actuarial valuation. The numerical findings and membership data supporting this analysis are shown in Section III.

In conducting the actuarial valuation, certain assumptions were made as to the future experience of the system. A summary and discussion of each of the assumptions is contained in Section IV.

The valuation is based upon the Sheriffs' Retirement Act and incorporates all amendments as of July 1, 1990. A summary of the major provisions of the Act is contained in Section V.

Actuarial Certification

The results of the actuarial valuation shown in this report are based upon information provided by the Public Employees' Retirement Division regarding plan participants, plan assets and other matters. The values have been calculated on the basis of actuarial assumptions which, in my opinion, are appropriate for purposes of this valuation.

This valuation has been prepared in accordance with generally accepted actuarial principles and practices and, to the best of my knowledge, fairly reflects the actuarial position of the Sheriffs' Retirement System as of July 1, 1990.

Alton P. Hendrickson
Member, American Academy
of Actuaries

Section II

Analysis of Valuation

Results of Valuation

An actuarial valuation has been conducted as of July 1, 1990 for the Sheriffs' Retirement System. This valuation has determined that the percent of each member's compensation required to fund the benefits as they accrue in the future is 13.67%. The required amount is adequately funded by the statutory contribution rate of 14.67%. The system has no unfunded past service liability.

Valuation of Assets

The actuarial position of the Sheriffs' Retirement System remains strong. The assets reported in the valuation grew significantly during the biennium, due largely to the handling of the market value gain in assets. Prior to 1988, assets were based upon the cost value. In order to better recognize the actual financial position of the funds, the valuation now recognizes market value gain. To smooth the year to year fluctuations, each year's gain or loss is recognized over a six year period. This means that 1/6 of the gain or loss is recognized the first year, with an additional 1/6 recognized each year thereafter, until the full amount is recognized after six years. The table below illustrates this valuation:

Market Value as of 6/30/90	$34,893,085	
Cost Value as of 6/30/90	$32,909,067	
1990 Market Gain	113,763	x 1/6
1989 Market Gain	818,734	x 1/3
1988 Market Gain	-666,248	x 1/2
1987 Market Gain	-592,111	x 2/3
1986 Market Gain	1,395,780	x 5/6
Prior Market Gain	914,100	
Adjusted Market Value	$34,550,324	

Benefit and Contribution Changes

The Sheriffs' Retirement System formerly provided normal retirement after 25 years of service and attaining age 55. Early retirement was permitted after 20 years of service and attaining age 55. Effective July 1, 1989, the provision was changed to allow retirement after 24 years of service for members hired prior to July 1, 1989. Members hired after that date must attain age 50. Members can retire early after 15 years of service provided they have attained age 50.

The cost of this eligibility change was 1.25% of compensation. The present contribution schedule was adequate to cover the additional costs, and no contributions increases were required.

A provision has been made to grant post-retirement benefit adjustments when investments earnings on assets allocated to retirees exceed the actuarially assumed rate. The amount available in 1989 was $209,920. An amount of $225,792 has been reserved in this valuation to provide benefits adjustments on January 1, 1991.

Actuarial Assumptions

The actuarial assumptions used in the valuation as of July 1, 1988 were continued in this valuation. A review of the system's data and experience did not reveal any deviations which warranted a change.

Summary of Data

The membership decreased slightly during the biennium from 509 active members to 508. The average active member is age 40, was employed at age 32 and has completed 8 years of service.

The average annual compensation increased from $22,009 to $23,200. The total annual payroll is $11,785,495.

The number of members receiving benefits grew from 74 in 1988 to 85 in 1990. The average retiree is age 69 and retired at age 61 with 22.5 years of service. The average retirement benefit is $583, which increased from $503 in 1988.

Conclusion

Based upon the results of this valuation, the Sheriffs' Retirement System is actuarially sound. The accrued liability of the system grew by $6.1 million during the biennium. This was more than offset by an increase of $8.5 million in the system's assets.

Section III

Schedule 1

Sheriffs' Retirement System

Normal Cost Allocation

(1)	Normal Cost Contribution Rate	
	(a) Retirement	9.90%
	(b) Death	0.55
	(c) Disability	1.42
	(d) Vested	1.47
	(e) Withdrawals	0.33
	(f) Total Rate	13.67%
(2)	Present Value of Future Salaries Of Current Members	$ 101,851,172
(4)	Present Value of Future Normal Costs For Current Members (1(f) * (2))	$ 13,923,055

Schedule 2

Sheriffs' Retirement System

Present Value of Benefits

(1)	Present Value of Benefits - Inactive Members	
	(a) Retirement	$ 3,274,748
	(b) Death	596,227
	(c) Disability	1,823,594
	(d) Vested	368,738
	(e) Withdrawals	103,719
	(f) Benefit Adjustment	203,213
	(g) Total Inactive	$ 6,370,239
(2)	Present Value of Benefits - Active Members	
	(a) Retirement	$ 26,377,983
	(b) Death	1,060,954
	(c) Disability	2,779,462
	(d) Vested	3,613,639
	(e) Withdrawals	447,707
	(f) Total Active	$ 34,279,745
(3)	Total Liabilities	$ 40,649,984

Schedule 3

Sheriffs' Retirement System

Liability Allocation and Statutory Funding

(1)	Unfunded Past Service Liability	
	(a) Present Value of Benefits	$ 40,649,984
	(b) Present Value of Future Normal Costs	$ 13,923,055
	(c) Fund Assets	$ 34,550,324
	(d) Unfunded Liability (a)-(b)-(c)	$ 0
(2)	Contribution Rates	
	(a) Unfunded Contribution Rate	0.00%
	(b) Normal Cost Rate (Schedule 1)	13.67
	(c) Statutory Funding Rate	14.67%

Schedule 4

Sheriffs' Retirement System

Comparison of Valuations

		1988	1990
(1)	Unfunded Past Service Liability		
(a)	Present Value of Benefits	$34,941,157	$40,649,984
(b)	Present Value of Future Costs	$14,688,774	$13,923,055
(c)	Fund Assets	$26,077,888	$34,550,324
(d)	Unfunded Liability	$ 0	$ 0
(2)	Amortization Period and Contribution Rates		
(a)	Years for Amortization	0	0
(b)	Unfunded Contribution Rate	0.000%	0.000%
(c)	Normal Cost Rate	12.523	13.670
(d)	Statutory Funding Rate	14.670%	14.670%
(e)	Amortization Schedule Rate*	12.523%	9.759%
(3)	Active Members		
(a)	Number of Members	508	508
(b)	Annual Payroll	$10,865,184	$11.785,495
(c)	Average Annual Salary	$ 21,388	$ 23,200
(4)	Inactive Members		
(a)	Number of Retired	47	51
(b)	Number of Disabled	18	23
(c)	Number of Survivors	9	11
(d)	Number of Vested Deferred	0	6
(e)	Annual Benefits	$ 443,736	$ 574,825
(f)	Average Monthly Benefit	$ 500	$ 564

* Rate required to amortize each year's new liabilities over 40 years.

Schedule 5

Table 1

Sheriffs' Retirement System

Number of Active Members

Years of Service	Member's Age									
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	Total
0-4	15	42	44	43	36	10	7	3	3	203
5-9		7	28	29	20	13	8	4	5	114
10-14		1	17	36	26	12	10	8	2	112
15-19				14	16	13	9	3	4	59
20-24				1		4	5	3	1	14
25-29							2	1	1	4
30-34								2		2
35-39										
40-UP										
Total	15	50	89	123	98	52	41	24	16	508

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Table 2

Sheriffs' Retirement System

Average Salaries of Active Members

Years of Service	Member's Age									
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	Total
0-4	17651	20003	19849	20411	20439	22616	21922	22189	19579	20180
5-9		22068	23249	23949	24664	24250	24738	25833	19627	23753
10-14		20382	26271	25066	25694	24738	23822	29163	28036	25552
15-19				26936	26947	28385	25141	25863	27730	26984
20-24				31334		25815	26266	26437	23159	26314
25-29							29369	33282	20146	28041
30-34								23292		23292
35-39										
40-UP										
Total	17651	20300	22145	23439	23758	25202	24534	26666	22948	23200

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Table 3

Sheriffs' Retirement System

Number of Vested Inactive Members

Years of Service	Member's Age									
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	Over 60	Total
0-4										
5-9										
10-14				3	1		1	1		6
15-19										
20-24										
25-29										
30-34										
35-39										
40-UP										
Total				3	1		1	1		6

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Table 4

Sheriffs' Retirement System

Number of Retired Members

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4								1		1
5-9										
10-14						1	1	3		5
15-19						3	1		3	7
20-24		1	1	1		6	5	3	2	19
25-29			3	2	2	3	2	2		14
30-34					1	1	2			4
35-39										
40-UP						1				1
Total		1	4	3	3	15	11	9	5	51

Table 5

Sheriffs' Retirement System

Average Benefits of Retired Members

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4								138		138
5-9										
10-14						126	346	211		221
15-19						533	317		222	369
20-24		930	736	580		564	584	373	262	537
25-29			1140	625	657	891	532	311		739
30-34					795	1009	952			927
35-39										
40-UP						1652				1652
Total		930	1039	610	703	696	596	279	238	583

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Table 6

Sheriffs' Retirement System

Number of Disabled Members

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4	3		1	1	1					6
5-9	2	3	1							6
10-14		1				3				4
15-19	2		1	1	1	1	1			7
20-24										
25-29										
30-34										
35-39										
40-UP										
Total	7	4	3	2	2	4	1			23

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Table 7

Sheriffs' Retirement System

Average Benefits of Disabled Members

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4	611		646	441	410					555
5-9	781	624	751							697
10-14		970				445				577
15-19	455		985	364	328	452	643			526
20-24										
25-29										
30-34										
35-39										
40-UP										
Total	615	710	794	403	369	447	643			587

Table 8

Sheriffs' Retirement System

Number of Survivors

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4				1						1
5-9	1									1
10-14				1				1		2
15-19					2			1		3
20-24						1	1			2
25-29				1			1			2
30-34										
35-39										
40-UP										
Total	1			3	2	1	2	2		11

Table 9

Sheriffs' Retirement System

Average Benefits of Survivors

Member's Service	Recipient's Age									
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	Total
0-4				92						92
5-9	524									524
10-14				139				186		163
15-19					608			444		553
20-24						288	591			440
25-29				315			886			601
30-34										
35-39										
40-UP										
Total	524			182	608	288	739	316		425

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Section IV

Actuarial Funding Method

The true cost of the Sheriffs' Retirement System will be determined by its future experience. In determining the financial requirement of the fund, certain assumptions were made as to the expected future experience. This section summarizes the funding method applied as well as the basic assumptions used.

Any variations in the actual experience of the fund from those assumed in this valuation may cause changes in the projected future costs of the fund. It is therefore necessary that the actuarial assumptions be reviewed from time to time with adjustments as experience warrants. It is also important that regular valuations be performed to determine the financial effect of variations between the actual and assumed experience.

The assumptions shown below were based upon the past experience of the fund together with the projections as to future experience.

The method of funding employed is commonly referred to as the entry age normal cost method. This method establishes a normal cost of each fund as well as an unfunded accrued liability. The normal cost is the level percentage of total salaries required to fund the benefits, assuming this percentage has been contributed since each member's entry into the fund.

The unfunded accrued liability represents the excess of the present value of total liabilities over the present assets of the fund and the present value of expected future contributions for the normal cost.

In order to maintain the fund on an actuarially sound basis, the rate of contribution should be such as to meet the normal cost in addition to making progress towards the amortization of the unfunded liability.

Discussion of Actuarial Assumptions

Mortality Rates

The mortality rates for males and females are based upon the 1983 Group Annuity Mortality Table, and apply to both active members and those receiving benefits.

Disability Rates

The disability rates for males and females are based upon the 1983 Disability Table.

Withdrawal Rates

The withdrawal rates are based upon the actual experience of the system as determined in the 1987 withdrawal experience study.

Salary Scale

The rates of salary increase are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

It was assumed that the investment earnings would be 8% compounded annually.

Administrative Expenses

It was assumed that the system would incur no administrative expenses beyond those provided by investment earnings in excess of 8%.

Termination Benefits

It was assumed that all members terminating with less than ten years of service would receive an immediate withdrawal of their member contributions with interest. It was further assumed that members with ten or more years of service would select the most advantageous benefits under the given assumptions.

Mortality Rates

The mortality rates are based upon the 1983 Group Annuity Mortality Table.

Age	Deaths Per 10,000 Male Members	Deaths Per 10,000 Female Members
25	5	3
30	6	3
35	9	5
40	12	7
45	22	10
50	39	16
55	61	25
60	92	42
65	156	71
70	275	124
75	446	240
80	741	429
85	1,148	699

Disability Rates

The disability rates are based upon the 1983 Disability Table.

Age	Disabilities per 10,000 Male Members	Disabilities per 10,000 Female Members
25	1	1
30	2	3
35	3	5
40	6	9
45	12	15
50	20	22
55	51	41
60	105	87

Withdrawal Rates

The withdrawal rates illustrated below reflect the turnover experienced by the Sheriffs' Retirement System.

Age	Withdrawals Per 10,000 Active Members
25	875
30	619
35	559
40	459
45	294
50	166

Salary Scale

The salary increases are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

Future investment earnings are assumed to be 8% compounded annually.

Administrative Expenses

It was assumed that the administrative expenses would be recovered by investment earnings in excess of 8%.

Section V

Summary of Benefits and Contributions

Effective Date -	July 1, 1974
Member Contributions -	7% of salary.
County Contributions -	7.67% of salary.
Retirement Benefit -	Minimum service: 24 years Minimum age: 50, with no minimum age restriction for members elected or appointed prior to July 1, 1989. Early Retirement: After 15 years and age 50. Normal form: Life annuity with a death benefit equal to the balance of accumulated deductions not received by the member as of the date of death (modified cash refund annuity). Benefit: 2% of the average monthly salary during the highest 36 consecutive months of earnings for each of the first 25 years of service, plus 1.35% of the average monthly salary for each year of service in excess of 25 years, up to a maximum of 60% of earnings.
Early Retirement Benefit -	Minimum service: 15 years Minimum age: 50 Benefit: Actuarial equivalent of the accrued benefit based upon the payment commencing on the date he would have completed 24 years or reached age 60, whichever is less.
Disability Benefit -	Service disability: 50% of the final average salary. Nonservice disability: Actuarial equivalent of the accrued retirement benefit.
Death Benefit -	Service death: 50% of the average monthly salary during the highest 36 consecutive months of earnings less any amounts payable under the Workers' Compensation Act. Nonservice death: Actuarial equivalent of the accrued retirement benefit based upon a retirement age of 60.

Termination Benefit -	Prior to completion of 10 years of service, return of member's contributions without interest. After completion of 10 years of service, either return of accumulated contributions with interest or the actuarial equivalent of the accrued retirement benefit based upon a retirement age of 55, if involuntarily terminated.